



INDUSTRIAL SHIELDS

USER GUIDE

ARDBOX FAMILY



Ardbox User Guide:

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INDUSTRIAL SHIELDS

COMPACT PLC.



INDUSTRIAL SHIELDS

ARDBOX FAMILY GUIDE



A compact PLC based in Open Source Hardware technology. With different Input/Outputs Units.

Supply Voltage

24 Vcc

Compact

DIN rail mounting



Safety

Industrial
communications

I/Os

Digital
Analog
Relay

COMPACT PLC ARDUINO 24Vcc ARDBOX

MODEL TYPE	PNP	TCH	RELAY	ANALOG
Input Voltage	24Vcc			
I max.	0,5A			
Size	100x45x115			
Clock Speed	16MHz			
Flash Memory	32KB of wich 0,5KB used by bootlader			
SRAM	2KB			
EEPROM	1KB			
Comunicaciones	I2C hasta 127 elementos. – Puerto Serie RS-232 (1)			
TOTAL Input points	6	10	8 (+2)	10
TOTAL Output points	14	10	8 (+2)	10
Type of signals				
Input/Output configurable (5Vcc)	-	-	2	-
* Analog Input 10bit (0-10Vcc)	-	-	6	9
* Digital Input (24Vcc)	6	10	-	10
* Interrupt Input HS (24Vcc)	-	2	2 (5Vcc) I/O's configurable	1
* Analog Output (0-10Vcc)	-	-	-	7
* Digital Output (24Vcc)	14	8	-	10
* PWM Output 8bit (24Vcc)	-	-	-	6
* Relay (220Vac - 5A)	-	2	8	-
Expandability	I2C - 127 elements - Serial Port RS-232			
Reference	IS.AB20PNP.base	IS.AB20TCH.base	IS.AB18REL.base	IS.AB20AN.base

*** By using this type of signal can no longer use Digital signal (24Vcc)
You must to read product Datasheet.
(1) With previous request. IMPORTANT**



Technical Specifications

General Specifications:

Item		PNP	TCH	RELAY	ANALOG
Power supply voltage	DC power supply	24Vdc			
Operating voltage range	DC power supply	20.4 to 25.4Vdc			
Power consumption	DC power supply	30VAC max.			
External power supply	Power supply voltage	24Vdc			
	Power supply output capacity	700Ma			
Insulation resistance		20M Ω min.at 500Vdc between the AC terminals and the protective earth terminal.			
Dielectric strength		2.300 VAC at 50/60 HZ for one minute with a leakage current of 10mA max. Between all the external AC terminals and the protective earth terminal.			
Shock resistance		80m/s ² in the X, Y and Z direction 2 times each.			
Ambient temperature (operating)		0° to 45°C			
Ambient humidity (operating)		10% to 90% (no condensation)			
Ambient environment (operating)		With no corrosive gas			
Ambient temperature (storage)		-20° to 60°C			
Power supply holding time		2ms min.			
Weight		190g max.	190g max..	190g max..	190g max.

Performance Specification:

Item	PNP	TCH	RELAY	ANALOG
Control method	Stored program method			
I/O control method	Combination of the cyclic scan and immediate refresh processing methods.			
Programming language	Arduino IDE. Based on wiring (Wiring is an Open Source electronics platform composed of a programming language. "similar to the C". http://arduino.cc/en/Tutorial/HomePage			
Microcontroller	ATmega32u4			
Flash Memory	32kb of wich 4 kb used by bootloader			
Program capacity (SRAM)	2.5kb			



EEPROM	1kb
Clock Speed	16MHz

I/Os PINOUT

PINOUT											
ARDBOX PNP			ARDBOX ANALOG			ARDBOX RELAY			ARDBOX TCH		
Left side											
Ardbox Connect or	Arduino Pin	Function	Ardbox Connect or	Arduino Pin	Function	Ardbox Connect or	Arduino Pin	Function	Ardbox Connect or	Arduino Pin	Function
LP00	0	Digital Input	Q0.6	3	Analog/PWM/	LP00	4	Relay 1 Out	LP00	0	Digital Input
LP01	1	Digital Input			digital Output	LP01			LP01	1	Digital Input
LP02	2	Digital Input	Q0.5	5	Analog/PWM/	LP02	5	Relay 2 Out	LP02	2	Digital Input
LP03	3	Digital Input			digital Output	LP03			LP03	3	Digital Input
LP04	4	Digital Input	Q0.4	6	Analog/PWM/	LP04	6	Relay3 Out	LP04	4	Digital Input
LP05	5	Digital Input			digital Output	LP05			LP05	5	Digital Input
LP06	6	Digital Input	Q0.3	9	Analog/PWM/	LP06	7	Relay4 Out	LP06	6	Digital Input
LP07	7	Digital Input			digital Output	LP07			LP07	7	Digital Input
LP08	8	Digital Input	Q0.2	10	Analog/PWM/	LP08	8	Relay5 Out	LP08	8	Digital Input
LP09	9	Digital Input			digital Output	LP09			LP09	9	Digital Input
LP10	10	Digital Input	Q0.1	11	Analog/PWM/	LP10	9	Relay6 Out	LP10	10	Digital Output
LP11	11	Digital Input			digital Output	LP11			LP11	11	Digital Output
LP12	12	Digital Input	Q0.0	13	Analog/PWM/	LP12	10	Rela7 Out	LP12	Gnd	Gnd
LP13	13	Digital Input			digital Output	LP13			LP13	Gnd	Gnd
LP14	Gnd	Gnd	NC	-	NC	LP14	12	Digital In/Out 5Vdc* ¹	LP14	Gnd	Gnd
Gnd	Gnd	Gnd	Gnd	-	GND	LP10	9	Relay6 Out	Gnd	Gnd	Gnd
24Vdc	-	Power 24Vdc	24Vdc	-	24Vdc	LP11			24Vdc	-	Power 24Vdc

¹ Connect to Pin of Arduino Leonardo board.



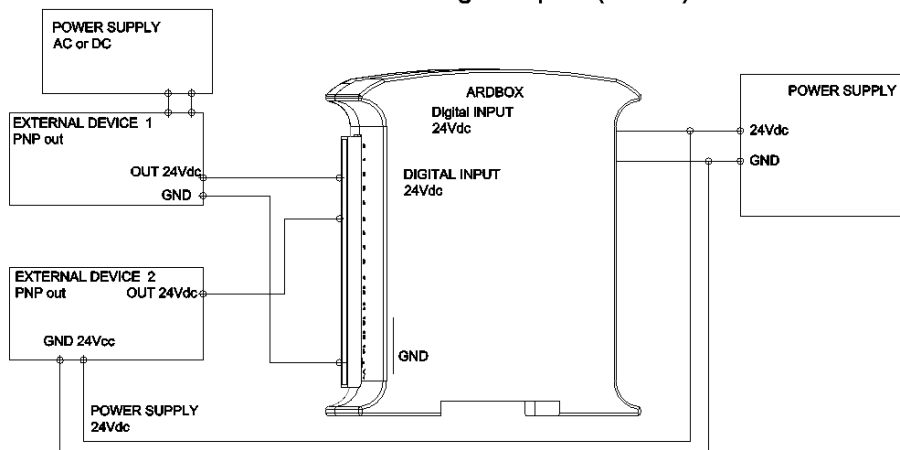
LEDS											
ARDBOX PNP			ARDBOX ANALOG			ARDBOX RELAY			ARDBOX TCH		
Ardbox Connector	Arduino Pin	Function	BOX	SIGNAL	Function	BOX	SIGNAL	Function	Ardbox Connector	Arduino Pin	Function
RP00	NC	NC	0	Q0.1	Analog/PWM/Dig. Out	0	NC	-	RP00	NC	NC
RP01	A0	Digital Input	1	Q0.0	Analog/PWM/Dig. Out	1	NC	-	RP01	A0	Digital
RP02	A1	Digital Input	2	Q0.3	Analog/PWM/Dig. Out	2	RP04	Digital Input	RP02	A1	Input
RP03	A2	Digital Input	3	Q0.2	Analog/PWM/Dig. Out	3	RP05	Digital Input	RP03	A2	Digital
RP04	A3	Digital Input	4	Q0.5	Analog/PWM/Dig. Out	4	LP02	Relay Output	RP04	A3	Input
RP05	A4	Digital Input	5	Q0.4	Analog/PWM/Dig. Out	5	LP00	Relay Output	RP05	A4	Digital
RP06	A5	Digital Input	6	Q0.7	Digital Output	6	LP06	Relay Output	RP06	A5	Input
RP07	Gnd	Gnd	7	Q0.6	Analog/PWM/Dig. Out	7	LP04	Relay Output	RP07	Gnd	Digital
RP08	Gnd	Gnd	8	Q0.9	Digital Output	8	LP10	Relay Output	RP08	Gnd	Input
RP09	Gnd	Gnd	9	Q0.8	Digital Output	9	LP08	Relay Output	RP09	Gnd	Digital
RP10	Gnd	Gnd	10	I0.1	Analog/ Digital Input	10	RPA	Relay Output	RP10	Gnd	Input
RP11	Gnd	Gnd	11	I0.0	Digital Input	11	LP12	Dig. In/Out.	RP11	Gnd	Digital
RP12	Gnd	Gnd	12	I0.3	Analog/ Digital Input	12	NC	-	RP12	Gnd	Input
RP13	Gnd	Gnd	13	I0.2	Analog/ Digital Input	13	NC	-			Gnd
RP14	Gnd	Gnd	14	I0.5	Analog/ Digital Input	14	RP07	An/Dig Input	RP13	12	Gnd
RP15	Gnd	Gnd	15	I0.4	Analog/ Digital Input	15	RP06	An/Dig Input	RP14		Gnd
RP16	NC	NC	16	I0.7	Analog/ Digital Input	16	RP09	An/Dig Input			Gnd
			17	I0.6	Analog/ Digital Input	17	RP08	An/Dig Input	RP15	13	Gnd
			18	I0.9	Analog/ Digital Input	18	RP11	An/Dig Input	RP16		Gnd
			19	I0.8	Analog/ Digital Input	19	RP10	An/Dig Input			Gnd
											Relay 1 Output
											Relay 2 Output

Type Connection:

Input connections:

Digital In:

Connection digital Inputs (24Vdc)

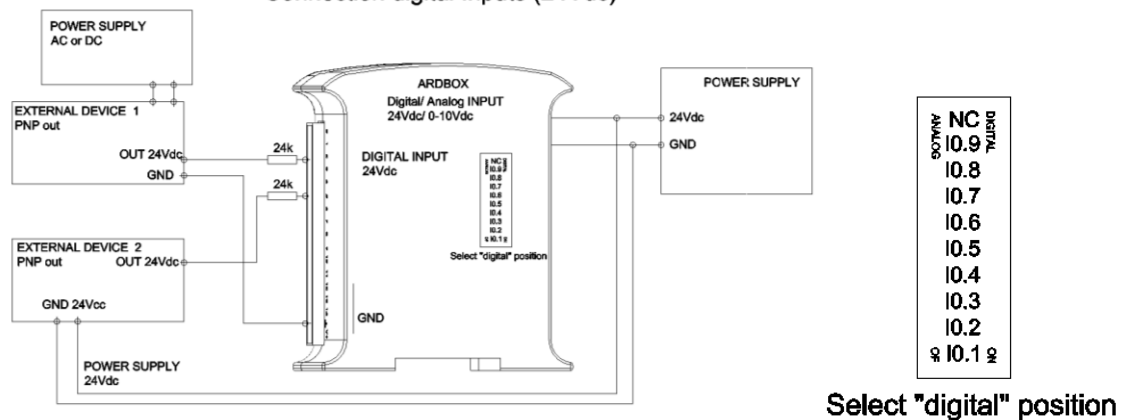


Digital/Analog configurable In:

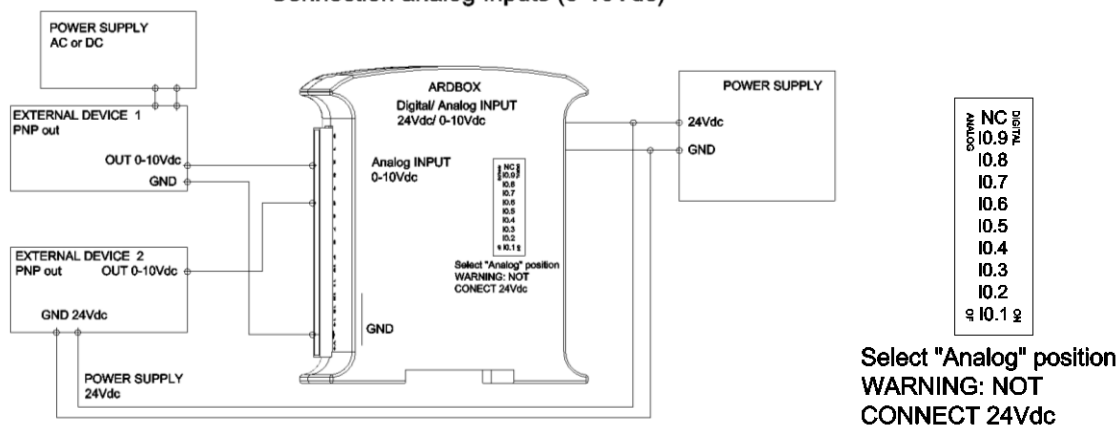
Some pins can work in three different modes. Analog and Digital input signal. IMPORTANT: to have the switch in correct position.



Connection digital Inputs (24Vdc)



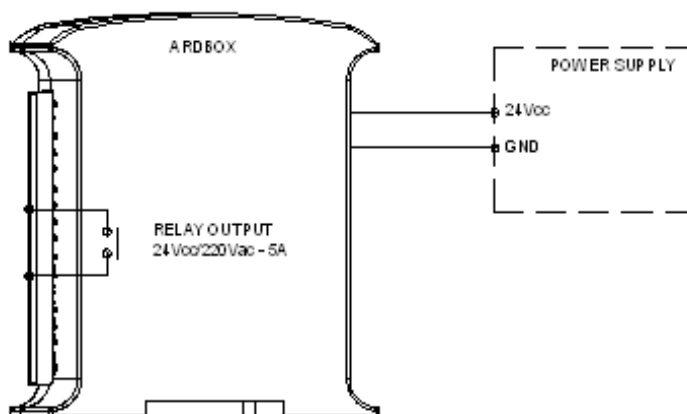
Connection analog Inputs (0-10Vdc)



Output connection:

Relay Out:

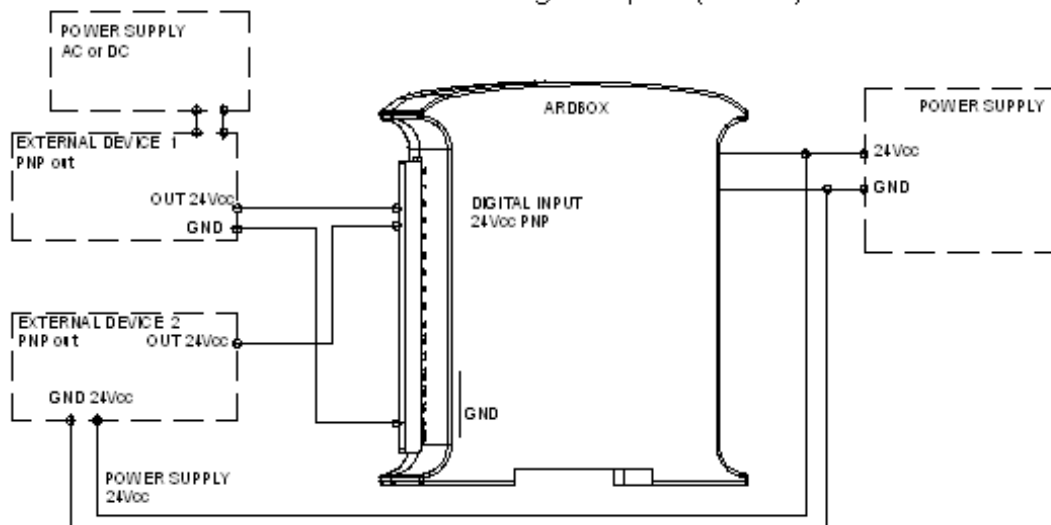
Connection Relay Output



Digital Out:



Connection digital Inputs (24Vcc)



Digital/Analog configurable Out:

Some pins can work in three different modes. Analog and Digital output signal. IMPORTANT: to have the switch in correct position.

Switch position Analog/PWM/digital Out:

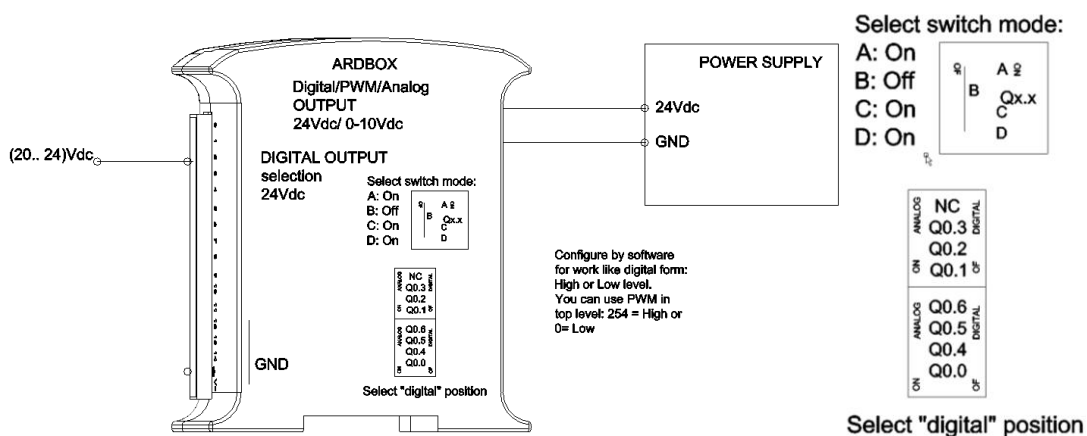
A	B	C	D	Vout
On	On	On	On	10Vdc
On	Off	On	On	24Vdc

* Whith 10Vdc configure, you can use Digital signal or Analog Signal:

Digital Output:



Connection digital Output (24Vdc)

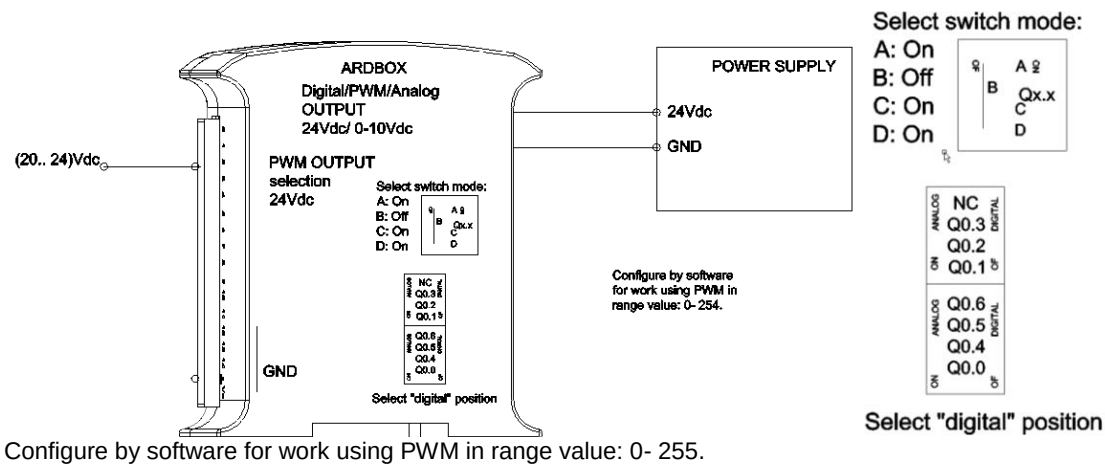


Configure by software for work like digital form: High or Low level.
You can use PWM: 255=High and 0=Low



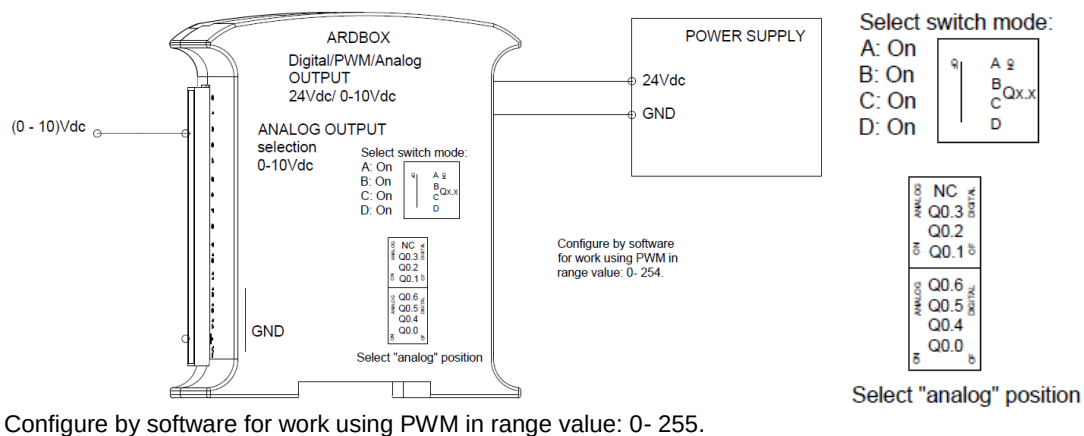
PWM Output:

Connection PWM Output (24Vdc)

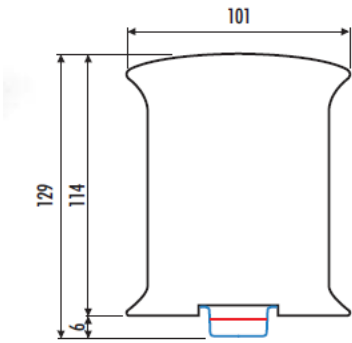


Analog Out:

Connection analog Output (0-10Vdc)

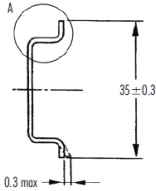
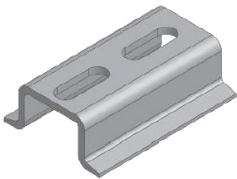


Dimension ARDBOX Family:

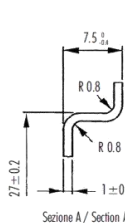


45mm de ancho

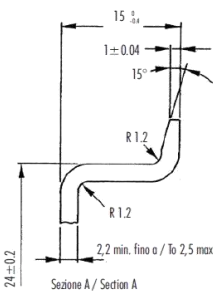
DIN rail mounting:



Profilato a cappello TH 35-7,5
Top hat rail TH 35-7,5



Profilato a cappello TH 35-15
Top hat rail TH 35-15



CARATTERISTICHE	METODO	UNITA' DI MISURA	BLENDE PC/ABS
Meccanico			
Resistenza a trazione allo snervamento	ASTM D638	MPa	68
Resistenza a trazione a rottura	ASTM D638	MPa	48
Allungamento a rottura	ASTM D638	%	59
Modulo in flessione	ASTM D790	MPa	2894
Prova Load con intaglio	ISO 180/14	KJ/m ²	5.5
Termiche			
Temp. di ammolimento Visc. metodo B	ASTM D1525	°C	114
Temperatura Ricotta 1.81 MPa	ASTM D446	°C	97
Fisiche			
Peso specifico	ASTM D792	g/cm ³	1.21
Ritiro nella stampo	ASTM D955	%	0.4/0.6
Melt Flow Index 260°C - 98N	ASTM D1238	g/10'	11.1
Comportamento alla fiamma			
Autoestinguenza (mm di spessore)	UL94	-	V-0 (0.8)
Filo Incondenscon. 3.2 mm	IEC 6095 2.1	°C	960

Italtronic si riserva il diritto di modificare il materiale con cui realizza i propri prodotti senza obbligo di preavviso.

FEATURES	TEST METHOD	UNITS	BLENDE PC/ABS
Mechanical test			
Resistance to tensile stress at yield	ASTM D638	MPa	68
Tensile strength	ASTM D638	MPa	48
Ultimate elongation	ASTM D638	%	59
Flexing modulus	ASTM D790	MPa	2894
Load test notched	ISO 180/14	KJ/m ²	5.5
Thermal test			
Visc softening temperature method B	ASTM D1525	°C	114
Reheating temperature 1.81 MPa	ASTM D446	°C	97
Physical test			
Specific gravity	ASTM D792	g/cm ³	1.21
Mould shrinkage	ASTM D955	%	0.4/0.6
Melt Flow Index 260°C - 98N	ASTM D1238	g/10'	11.1
Flame test			
Self extinguish (thickness in mm)	UL94	-	V-0 (0.8)
Incondensable thread 3.2 mm	IEC 6095 2.1	°C	960

Italtronic can operate any change of the materials without being obliged to forewarn.

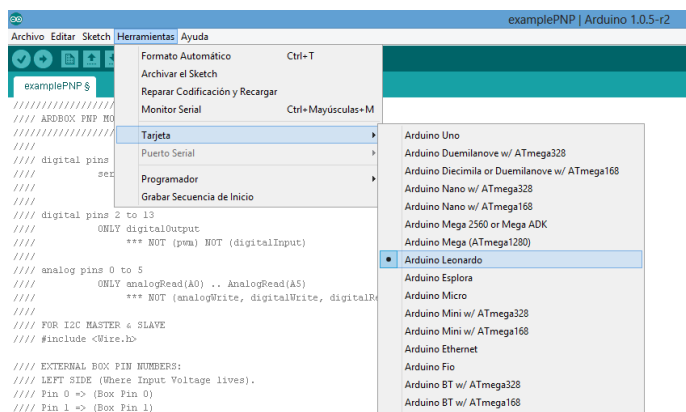


Software Interface:

Arduino IDE is compatible for programm these PLCs. You must to download a start code in www.industrialshields.com at product page in “document files”section and then It’s necessary open it with Arduino IDE.

Configuration about Arduino IDE:

All Ardbox PLCs use an Arduino Leonardo and you need to choose these opcion in Arduino IDE.



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